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JUL 15 1930



SCIENCE NEWS-LETTER

The Weekly Summary of Current Science
A SCIENCE SERVICE PUBLICATION

\$5 a Year 15c a Copy



July 12, 1930



FISH LOOKS AT FISHERMAN

Submarine Drama, as the Participant Beholds It

(See page 18)

Vol. XVIII

No. 488

First a Hen, Then Rooster, Hen Again

Biology

Students of Biology are Puzzled by Freak Fowl

A HEN that became a rooster and then exercised the prerogative of her former sex and changed her mind, becoming a hen again, is the freak fowl described in the *Journal of Heredity* by Drs. R. A. McCance and A. Walton of the pathological department, King's College Hospital, London.

The bird, a light Sussex pullet, was hatched with seven other pullets in March, 1925. In October of the same year all eight commenced to lay and continued to do so till the spring of 1926. All then moulted and while the normal birds soon put on their new plumage this freak remained practically nude all summer and autumn.

Early in 1927 she slowly assumed male plumage and grew spurs, but no comb. She also put on additional height, becoming two inches taller than her sisters.

She (or "he") commenced to rule

the farmyard. She called the other hens to food, escorted them to the nest boxes, shepherded them about the yard, and in general conducted herself like the "cock of the walk". And she laid no eggs at all. In the autumn of 1927 she failed to moult with the others.

During the following spring she was seen going to the nests and clucking. A dozen eggs were placed under her as an experiment. Still wearing her male feathers, she faithfully sat on them, hatching out eleven chicks and proving an excellent mother afterwards.

Subsequently, still in male disguise, she began to lay eggs again. That autumn she moulted, resuming female feathers, but keeping her spurs. Throughout the winter of 1928 and spring of 1929 she laid regularly, mostly double-yolked eggs.

Usually when a hen reverses her sex, an examination of her internal organs will disclose some diseased condition, most probably in her ovaries. But when this hen-rooster-hen was killed and all of her glands subjected to minute examination nothing whatever could be found wrong with them. She remains an unsolved physiological riddle.

The editor of the *Journal of Heredity* adds a note telling of a somewhat similar case recorded a couple of years ago in this country. A hen assumed male feathers, but continued to lay. While she was still disguised as a rooster she was mated to a real White Leghorn male bird, and produced fertile eggs. She did not, however, raise her own family. Subsequently she moulted and her new feathers were those proper to her female sex.

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In Caleb's City

RUINS of the palace which once rose above the Canaanite royal city of Kirjath-Sepher are to be excavated this summer by a joint expedition from Xenia Theological Seminary of St. Louis, and the American School in Jerusalem. Dr. W. F. Albright of the Johns Hopkins University and Prof. M. G. Kyle of Xenia Theological Seminary will direct the work of this third campaign to unearth Kirjath-Sepher's history.

Kirjath-Sepher figures in Biblical record as the town which Caleb so desired to capture from the Canaanites that he offered his daughter's hand to the Israelite who would take the stronghold. The mound which represents this historic city lies about fifty miles south of Jerusalem.

Ruins of six settlements, in layers one above the other, have been found in earlier expeditions.

Archaeology

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The Answer Is In This Issue

Can a chicken change its sex? p. 18—How does a fisherman look to a fish? front cover—What new anesthetic promises to make operations more pleasant? p. 19—Can pure reasoning cause heart disease? p. 19—What eye trouble are glandular secretions being used to treat? p. 19—Why did George Washington chop down the cherry tree? p. 20—Does thinking depend on brains more than childhood training? p. 21—How may some geniuses get an early start toward practising originality? p. 22—How is power to be gotten from the ocean bottom? p. 23—Why has Santo Domingo no native mammals? p. 23—Can there be hot ice? p. 24—How does a "talkie" clearly record the voice of one person from a noisy throng? p. 24—What metal is as cheap as iron? p. 26—Why was the Arctic climate never tropical? p. 26—Can mental distress cause stomach ulcers? p. 27—How might typhus be carried? p. 30.

Fish's-Eye View

A POET once wished for the gift to see ourselves as others see us. An artist has achieved it. Wilfrid Swancourt Bronson, of New York, has cultivated the ability to see things from the fish's point of view, taking into account the squeezed perspective one gets through the little "window" in the water directly overhead, the "breaking" of poles sticking into the water by refraction, and the dead mirror-surface of the "top" of the water outside the limited cone through which the upper world of the air is visible. The picture on the cover of this issue of the SCIENCE NEWS-Letter is from "Fingerfins", a charming little book of which Mr. Bronson is author as well as illustrator. It depicts the capture of the little Sargassum fish that is the hero of the tale.

Ichthyological Optics
Science News-Letter, July 12, 1930

People of this country spend more on medicines than on doctors' bills, a survey indicates.

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SCIENCE NEWS-Letter. The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by Watson Davis.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C. Address

all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—\$5.00 a year postpaid. 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

Greater Safety From New Anesthetic

Medicine

Brings Long Sleep Before and After Operation

AVERTIN, a new anesthetic developed in Germany which is just beginning to be used by American surgeons, was described to the American Medical Association in Detroit recently by Dr. Arthur M. Shipley of the University of Maryland School of Medicine.

This anesthetic is rapidly replacing ether in many types of operations. It is safe and has none of the objectionable features of ether. The drug is injected about half an hour before the operation and the patient falls quickly into a deep sleep. There is no fighting nor any feeling of apprehension. The patient comes to the operating room without having had any nervousness and consequently is in much better shape to stand the operation.

There is no nausea or restlessness afterwards, and the patient is spared much of the pain and discomfort immediately following the operation because he does not awaken until hours after it is over. This long, natural sleep gives the body a good start toward healing before consciousness returns fully and this hastens recovery. In some cases ether is given in addition to avertin, but only a small amount is needed.

If the patient has disease of kidneys, liver, rectum, advanced disease of the blood, pulmonary tuberculosis or colitis or is very old and feeble, avertin cannot be used. It has been very successful in brain and eye operations. Because it reduces the blood pressure somewhat, it is particularly good for operations on patients with high blood pressure which might otherwise be hazardous. The technical name for avertin is tribromethanol. It was developed by Dr. Richard Willstaetter of Munich and Dr. Duisberg of Jena.

Why Heart Disease?

MAN has developed his brain at the expense of his body, Dr. William J. Mayo of Rochester, Minn., suggested at the meeting. The poet's notion that the heart is related closely to the emotions has a basis in fact, Dr. Mayo said. This theory has been scoffed at by scientists who claimed that the heart is merely a blood pump and we must look to

Medical science moves apace, it is well shown in reports brought by the Science Service representative from the recent gathering of 10,000 physicians and surgeons in Detroit to attend sessions of the American Medical Association. At these meetings foremost research workers in medicine reported their progress and discoveries. Important developments which they discussed are described herewith and on page 27.

the mind and nervous system for the emotions.

When the mind gained control of the body and the sympathetic nervous system lost some of its power to regulate man's actions, man learned to control his emotions. This may have thrown an extra strain on the heart and accounts, perhaps, for its deterioration in civilized man. Heart disease is the leading cause of death today.

Ineffective Opium

OPIUM addiction does not lead to abnormal changes of the body. Even the intense craving and severe symptoms that occur when the addict is deprived of his drug can be controlled. These were the unexpected findings of a study of opium addiction reported by Dr. Arthur B. Light of Philadelphia. He studied 100 cases carefully and was unable to find any significant changes due to the action of the drug.

Hysteria is probably a frequent complication of the terrible withdrawal symptoms, he found. One of the men studied appeared to suffer intensely during the treatment for addiction and exhausted the patience of his physicians. A year later when he was arrested for shoplifting the police could not find any trace of withdrawal symptoms. The man knew that if the charge of drug addiction could be held against him he would face an additional sentence. Dr. Light explained. He therefore restrained the symptoms by an effort of will.

New Glandular Treatment

GLANDULAR substances are now used to treat eye diseases as the latest development in the application of this method. How the powerful secretion of a gland was used to treat progressive shortsightedness in

100 patients was told by Dr. Meyer Wiener, eye specialist of St. Louis.

From the suprarenal glands, small cap-shaped organs lying just above the kidneys, comes the potent epinephrine, or adrenalin as it is more commonly known. This substance has been extensively used as a stimulant.

Dr. Wiener treats his patients with properties beneficial to nearsighted eyes.

Nearsightedness, or myopia, is not a disease in itself, Dr. Wiener explained, but is a sign of congenital weakness. This weakness affects the elastic part of the coating of the eye, so that the eyeball stretches and the lens of the eye gets out of focus.

Dr. Wiener treats his patients with epinephrine and advises strenuous exercise in an effort to increase the secretion of this substance by the patient's own suprarenal glands. In 79 cases following this method the nearsightedness was checked. Dr. Wiener said that while one type of progressive myopia is benefitted by this method of treatment, another type shows some other influencing factor as yet undiscovered.

Glands Wrongly Blamed

GLANDS are relieved of a large part of the blame for making people fat. A new theory of the cause of obesity was given at the meeting of the Association for the Study of Internal Secretions by Dr. Hermann Bernhardt of the University of Berlin. During the last 20 years nearly every endocrine gland has been supposed to be guilty of causing extreme fatness in people, but Dr. Bernhardt does not blame the glands for this unfortunate condition.

"It is impossible to accuse a certain endocrine gland of being the cause of obesity," he said. Very often disturbances of the glands are a factor, but they are not the prime factor. The control of fat is chiefly a function of the regulative center of the central nervous system. This is in the inner brain close to the pituitary gland. Tumor of the brain, hardening of the arteries, or such changes in general behavior of the body as hunger and thirst can bring about a failure of the fat-regulating center.

Have You Been



No. 1. The Impulsive Age—Digging up the garden roses seems a good idea to the three-year-old and she persistently digs away with no special aim in view. Yet, when tired, all of us are apt to slip into such impulsive childishness.



No. 2. The Common-Sense Age—She remembers that the drawing board and not the living room is the proper place for art.

(Photo, Washington Child Research Center)

The Four Ages

By Emily C. Davis

IF six-year-old George Washington really marched up to his father's best cherry tree and sunk his shiny new hatchet blade into the trunk, he was merely slipping back for a minute into the impulsive age of his earlier childhood. For that excited minute, young George was just about three years old, so far as his behavior was concerned.

By the time his father came on the scene to inquire about the situation, George had recovered from his impulsive brain-storm and had risen to a calm and philosophic level of behavior, probably a trifle higher than you would expect from a boy of his years.

This explanation is given, not with any idea of psycho-analyzing an American hero, but because the cherry-tree drama, authentic or not, is true to life and illustrates some of the latest psychological investigations.

Young Washington's behavior is repeated every day, and not only by children but by adults. If you doubt it, consider the man who impulsively hails an invitation to play golf when

his desk is piled high with papers marked "rush." Or, consider the woman who talks faster than she thinks, and whose tactless, four-year-old remarks betray her into serious consequences.

A Swedish professor of psychology has been looking into this question of the ups-and-downs of human behavior. He finds that in addition to your mental age and your age recorded by the calendar, you have a third—your developmental or behavior age.

Unlike your mental and calendar ages, your behavior age slides up and down the scale with great agility. If your behavior could be charted for a day, it would show a long jagged line ranging probably between the highest level of which you are capable, and the lowest. In most people that lowest is all the way down to impulsive babyhood. In general, however, you have one habitual behavior level, characteristic of yourself most of the time.

Psychologist Has "It"

The psychologist who has been

studying our American behavior is Dr. Gustav Jaederholm, of the University of Gothenburg, and author of a number of highly technical volumes. He has been watching the development of young America chiefly at a nursery school of Hull House, in Chicago.

The Swedish psychologist is an unusual personality, himself. His figure is stocky and plump. His face beams with genial happiness. You realize at a glance that children would adore him. From their point of view, this jolly person has "it."

To test on young Americans the theories that he had evolved by studying Swedish children, Dr. Jaederholm wanted to observe assorted children from two to seven years. They offered him at Hull House a collection of fifty, ranging over an array of nationalities, including little Mexicans, Jews, Slavs, Negroes, Greeks, and Russians.

A middle-aged scientist could not go running about a playroom after his lively little specimens. So he hit upon the plan of inviting himself regularly to lunch with three

Graduated From



No. 3. The Work Age—This is the time when boys and girls can hold their minds to study and work. Many adults never get past this stage and into the final stage.

(Photo, U. S. Children's Bureau)



No. 4. The Creative Age—Most of us rise to it once in while, but few live on the heights regularly. This is Nathalia Crane, who writes poetry and gets it published.

of Behavior?

Psychology

of them at a time. It worked. While they remained more or less quiet and together and consumed rations to carry them through a busy afternoon, he was able to steer the conversation and bring out each child's personality.

"I try to disappear and just be part of the group," he explained. "At first they ask why I am writing down shorthand. I say, 'Oh, I just forgot something.' Next day, one child asks again. 'Oh,' says the other, 'he's always forgetting something.' So, I am taken on that basis."

Out of these luncheon parties for four, supplemented by the histories of the children, Dr. Jaederholm has gained a new conception of how human beings grow up in their behavior—and sometimes how they fail to grow.

Examining the Children

He has found that there are four general levels or ages of development. You climbed up through these levels of behavior in childhood. Your behavior today may still be

assigned to one of these four "ages of man."

The first age, typical of the earliest years of existence, is the age of impulsiveness.

"I take the three-year-old up to a picture of a Dutch boy and ask if there is a cat in the picture," said the psychologist, explaining how the baby-mind works. "The three-year-old thinks I want him to say yes, so he says it. There is no end to this."

At this impulsive level of behavior, the child—or the adult who has temporarily slid backward into impulsiveness—cannot look ahead. Only the immediate present seems important.

"I tell the youngsters to come to me tomorrow and I will give them something nice," he continued. "They pester me all day, so that I can do nothing. But next morning nobody comes. At the age of three, they have forgotten all about it."

So long as the little human being lives continually in this careless, unthinking state, he is not ready to take on school work or responsibilities. In the daily routine of the

nursery school, Dr. Jaederholm found some children who would get everything mixed up. They could not brush their teeth. They never played group games sensibly with other children. These, he concluded, are the children who linger in the impulsive age. They have not come up to the next level, which is the age of common sense, or as the Swedish psychologist generally labels it, the deliberative age.

Boys and girls become sensible about the fourth year of their existence, he observed, but the shift depends a good deal on how much their parents and other older people talk to them, and treat them like sensible beings.

At this second age of his development, the child doesn't use any old silly ideas or impulses. He takes stock of a situation.

The little girl who has reached the common sense age can be expected to go to the corner store and bring back the loaf of bread, as directed. At least, the law of probability makes it reasonably safe to try the experiment.

Four Ages of Behavior—Continued

Brains and Thinking

The amount of thinking that you do as you go about your business depends somewhat on your brains. That is an accepted notion. But Dr. Jaederholm has come to the conclusion that the amount of thinking you do depends still more on your training in childhood in this trait of common sense deliberation. Sometimes a child is forced too early and too completely into this deliberative age, and becomes a little social prodigy.

Describing one of these social prodigies, he said:

"I have seen a boy of four years who was brought up by a divorced mother. Her one principle was that the child should not be like his father in any way. She developed the deliberateness of this boy to such a degree that I found he would do carefully and critically some of the things that grown people do not do. I said, 'Aren't you afraid you are overdoing it?' And so she stops a little, and the boy becomes more childish."

As an individual develops he never casts off the earlier types of his behavior, like a snake shedding last year's skin, but simply lives more and more in the higher level. These higher levels of behaving responsibly and usefully put the individual on a greater tension, like the stretching of an elastic band. And so, throughout life, he snaps back into the earlier, easier levels when he plays games or when he becomes very tired. Games and exercise give the burdened worker or head of a family the chance to be childish without endangering his career. They keep the tension from becoming too much of a strain.

Fatigue slackens the tension, too, but in an undesirable fashion. In fatigue, the tension is apt to be uncontrollably relaxed, perhaps without warning, at a time when the individual cannot afford to be childish.

Weariness leads to thoughtless remarks at afternoon teas, and to failures in pushing office deals. It explains a good many mistakes in bridge games, which caustic players rather truthfully pronounce "the sort of game you'd expect a child of four to play." It is not chance that the peak hour of traffic accidents is around five o'clock when tired workers are driving and walking home.

Looking at mental and nervous breakdowns from the behavior angle, Dr. Jaederholm explained that the person who becomes mentally ill may slip back almost entirely into his childish way of treating life. Once he succumbs, he may not have the elasticity to pull himself back to stand the stress of the sort of behavior that is expected of responsible citizens.

The third age of human behavior is experienced between the fourth and sixth year, Dr. Jaederholm observed. This is the time when the child leaves his carefree babyhood behind him, and discovers that he is expected to settle down to work. He has entered the effort or work age.

Slipping Back to Childhood

Not until he comes to this degree of maturity can a growing human being start on a school career. But now he can keep his attention on a book after the first few minutes of pleasing novelty have worn off. He can hold himself to the book task, even with more attractive ideas of things to do flitting through his mind, for he has grasped the conception of working with a distant goal in view. He can delay talking until the teacher calls on him, and still remember what he has so eagerly wanted to tell the class for perhaps a long five minutes. He is able to overcome the impulse to jump up and investigate the noise outside the schoolroom window. In short, by this time, the individual has entered the routine, work level on which most people remain, more or less, for the rest of their lives.

Some gifted ones grow out of this work-effort age, Dr. Jaederholm found. These are the geniuses, and all the lesser creators and experimenters, who voluntarily seek new experiences, and who try to convert themselves into something finer. But, except in the gifted person, the streak of originality is apt to run thin.

Most children start bravely to climb into this more interesting level of life, for youngsters are usually fearless enough to try new adventures, and have enough curiosity and enough energy for experiments. But the child's willingness to spend hours over a tangle of wires and coils that he calls a radio set, or his desire to spend time drawing pictures or writing verses is apt to run counter to adult plans for the daily routine.

People Easily Discouraged

With a little discouragement, the desire for voluntary experience is stamped out in most people, and they are content for the rest of their lives to stay on the less exciting work-a-day level. They climb once in a while to try something new, but when they get tired, or give way to fear or anger, or fall a victim of nerves, then they drop back one level—or two—or three.

The Swedish psychologist believes that the people who start a small child off in life cannot do so much to develop this creative trait as they can to teach the child to use his mind. If the creative or adventure spark is lacking, no urging will arouse it.

"But," he added, "it was the brilliant idea of the kindergarten to give the children the materials and let them do what they can."

The natural order of a human being's development can occasionally be reversed, he has observed. This is especially true of creative behavior. A tot who cries angrily and then stops and listens to himself and changes the tone of his cry, is voluntarily experimenting, though he may be far too young to reach the working age of his career.

Whether it is in some such ways that geniuses get an early start toward practising originality, Dr. Jaederholm has not yet investigated.

Behavior Growth Stunted

A human being's development may be stunted or twisted, back in the years when he should be progressing normally up the four levels of behavior. Among the fifty children studied at Hull House, the psychologist encountered some who were getting off to a bad start.

One little girl had had her normal development arrested in the common-sense age, because she was made to feel that she was a failure when she ambitiously tried to do the things that bigger children so easily achieved. She finally gave up trying to master new skills of using her hands, and contented herself with being the petted baby of the family.

Grown people need to watch their own behavior in dealing with children, and to make sure that they are not the cause of undesirable quirks in the child's unfolding personality, the investigation made clear.

Claude Still Seeks Ocean Power

Engineering

Another Mile-Long Tube to be Sunk in Gulf Stream

SABOTAGE accomplished at the last minute in the launching of the giant tubing being laid out into the Gulf Stream at Matanzas, Cuba, to bring cold water to the Claude sea power experimental plant, caused the total loss of the 6000 feet of costly tubing, Georges Claude, French physicist and inventor, has informed Science Service.

This is the second time that his attempt to tap the cool depths of the ocean has ended in disaster; yet M. Claude announced in his cable that a third large tube of insulated sheet iron was being made in France and that it would be launched at the end of August. The first conduit was lost in launching last September.

More than a mile long, over six feet in diameter, the corrugated sheet iron tube when successfully placed will reach out from the Cuban coast and suck up water from a depth of over a third of a mile. This water will have a temperature of about 50 degrees Fahrenheit.

This will provide the cooling water for Claude's unique power plant which, instead of heating water by burning fuel, will use the relatively hot surface water of the tropical ocean which is 35 to 40 degrees warmer than the cooling water to be brought by the conduit from the depths.

Awaiting the laying of the third conduit there may be seen on the shore at Matanzas Claude's unique power

plant that in trial operated successfully on waste hot water at Ougree on a Belgian river. It makes use of a boiler, turbine and condenser, like ordinary steam stations. But instead of being heated by a flaming fire, his boiler is at the temperature of surface water. Instead of being subject to hundreds of pounds of pressure, its pressure would be much less than that of the atmosphere outside.

Even the low pressure of the boiler would be higher than that of the condenser, and consequently steam from it would flow through the turbine to the condenser. Water from deep in the ocean would maintain the low pressure of the condenser by cooling and condensing steam from the boiler and turbine.

Because this process involves relatively small changes of temperature and pressure, large quantities of cool condensing water and warmer boiler water are required.

Although M. Claude's experiments are costing many thousands of dollars, the present power plant is experimental rather than commercial. He intends that it operate only a few months after the cold water conduit is finally laid. The information that the ocean power plant will give him will be used in the design and construction of a modest industrial power plant of about 12,000 kilowatt capacity.

Engineers accustomed to conventional power plants have not viewed M. Claude's experiments with great enthusiasm but his record of achieving what others have called impossible have made many confident that his plans will succeed. M. Claude is a scientist and engineer of world-wide reputation. He invented the first successful process for making liquid air and liquefying other gases; he pioneered in the field of making liquid ammonia out of the atmosphere; he is the inventor of glowing red neon lights that shine on our streets at night. His inventions are capitalized at \$150,000,000 in America alone.

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Columbus' Indians Made Them

Archaeology

LITTLE monkey heads, sad-faced or grinning, modeled out of clay to make handles for pottery jars, have been brought from Santo Domingo by Herbert L. Krieger, of the U. S. National Museum. These are some of the art works of Indians of the Arawak tribe which Columbus met in the West Indies.

Monkeys were never among the native creatures at home in the forests and villages of Santo Domingo, Mr. Krieger explains. The modeled monkey heads show that monkeys were brought there occasionally as pets or as rare importations from Mexico and Central America. Bones of monkeys, also unearthed by Mr. Krieger in Santo Domingo, fit in with this explanation.

The figurines and bones thus become bits of archaeological evidence offered to the biologist who may be tracing the early animal life of America. The West Indies represent a peculiar biological "pocket", where there were no mammals belonging to

a period of earth history later than the tertiary. The land bridge linking the West Indies and Yucatan was broken off before the true age of mammals began, and the animal life of Santo Domingo consists of small types such as bats and rodents.

Jaguar heads modeled in clay were also found by Mr. Krieger, as shown in the left picture. These are taken to be evidence that the Arawak Indians of Santo Domingo must have remembered the animals of their earlier home, which was in South America. The later generations of Arawaks, who had never seen the jaguar, continued to copy old art models representing the animal, Mr. Krieger's new collections indicate.

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The Chinese honey bee is not only lighter in weight than the Italian honey bee, but it carries to the hive a smaller load of pollen in comparison to its size.

Hot Ice

DR. P. W. BRIDGMAN of Harvard University has frozen water at a temperature of 180 degrees Fahrenheit, only 42 degrees below its boiling point. His product is ice as real as that which forms ice, so hot that it will burn one's hands.

It was made by putting water on ponds in the winter; but it is hot under a pressure of 290,000 pounds or 145 tons per square inch. Ordinary ice becomes unstable at pressures greater than 29,000 pounds per square inch and is replaced by other forms, one of which is stable at 290,000 pounds and temperatures as high as 180 degrees, Dr. Bridgman found.

He has conducted experiments with pressures as high as 580,000 pounds or 290 tons per square inch. Many interesting changes in the properties of substances take place under these unusual conditions.

Pressures of more than half a million pounds per square inch are meaningless until compared with atmospheric pressure of slightly less than 15 pounds, the pressure in steam boilers which seldom exceeds 1,200 pounds, or the pressure at the bottom of the deepest part of the Pacific Ocean which is little more than 15,000 pounds per square inch.

Physics

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Babies Smile First

A BABY starts smiling at the world before he really laughs at it, Ruth W. Washburn, psychologist at the Yale Psycho-Clinic, has observed.

Miss Washburn, who has been watching the smiles and laughter of children under a year old, has found a few babies so sober that they warrant the title "non-laughers." Others dimpled, sparkled, drew up the corners of their mouths, wrinkled their noses, or otherwise displayed the technique of laughter and smiling whenever the least excuse was offered. Contrary to popular tradition, fat babies are not jollier than lightweights.

Seven ways of shaping the mouth in smiling were found among the babies observed. A baby's way of smiling changes as it develops, and these developmental differences are more important than individual differences, Miss Washburn concluded.

Babies never laugh until they cry, it was also found. Such violent

laughter is an adult form of amusement. The type of smiling called "coy" was seen in only two baby girls and this was the only sex difference in smiling noted throughout the experiment. Miss Washburn believes, however, that judging from her casual observations of a two year old boy, coquettishness may yet be found and scientifically recorded among baby boys.

Psychology

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Machine Dancing

EVEN tap dancing may be coached with scientific technique. Men at the University of Illinois who are taking tap dancing as a pleasant form of physical education are having their mistakes set down against them as they dance, by a machine which records their foot beats on paper and compares the rhythm with a steadily beating metronome. The brass taps worn by the dancer are hooked up with an electrically recording apparatus for the tests.

The machine was invented by James J. Eddy, and the tests are under the supervision of Dr. Coleman R. Griffith, psychologist and director in research in athletics at the university.

The paper records, showing how well the student tap dancer keeps to the rhythms of the dance, are shellacked and kept as a guide to progress of the individual.

Physical Training

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Keeping Lemon Juice

LEMON juice is such an important source of vitamin C that many efforts have been made to find conditions under which it can be stored without losing its anti-scorbutic power.

John Williams and J. W. Corran, at the Carrow Works, Norwich, England, have found that vitamin C in lemon juice is particularly unstable in the presence of preservatives.

Potassium metabisulphite, which is the best preservative for lemon juice against fermentation, was found to have a definitely destructive action on vitamin C. The same was true of other preservatives such as sodium benzoate, formic acid, and oil of cloves.

The best way of storing lemon juice without destroying the vitamin was to adjust the acidity with hydrochloric acid to a certain point.

Chemistry

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IN VARIOUS FIELDS

Beam Microphone

AN artificial "whispering gallery" is one of the latest improvements in talking movies, for the device makes it possible to focus the microphone on the speakers, and shut out extraneous sounds. Recording engineers of the RKO Productions have developed the device, which is called the "beam microphone."

The device is really a searchlight turned backwards and using sound instead of light. A searchlight reflector has the shape known as a paraboloid. Light radiating from a point known as the focus is reflected in a parallel beam. The reflector also works backwards. If a parallel beam of light, as from a very distant object, falls squarely on the reflector, the light is concentrated at the focus. Searchlight mirrors have actually been used this way with sunlight to obtain high temperatures for experimental purposes. A reflecting telescope used by astronomers works the same way.

Waves of sound can also be concentrated by a parabolic reflector, and this is the principle of the beam microphone. A metal reflector about five feet in diameter is used, with the usual condenser microphone placed in the center at the focus. Around the outer edge is a cylinder of felt to shut out most of the sound that would come across the edge of the reflector.

Famous whispering galleries, in buildings throughout the world, depend on a similar principle of sound concentration. Some architectural freak may produce a curved wall that focusses the sound from a distant point. Then a person may hear a whisper from a position hundreds of feet away, but cannot hear ordinary conversation much closer.

Physics

Science News-Letter, July 12, 1930

Medal for Geologist

DR. LAUGE KOCH, Danish geologist and explorer of Greenland, will receive the American Geographical Society's Charles P. Daly gold medal for 1930 in recognition of his scientific studies in Greenland. Dr. José M. Sobral, head of the Argentina geological survey, will receive the society's David Livingstone centenary medal for 1930 as a tribute to his rapid mapping of the Andean area of Argentina.

Geology

Science News-Letter, July 12, 1930

SCIENCE FIELDS

Ice-Box Germination

CHILLING on ice hastens the germination of the large edible nut-pines regardless of their native habitats, according to G. R. Johnstone and Tema Shults Clare of the Botany department of the University of Southern California.

Torrey pine seeds from the Torrey Pine Preserve near La Jolla require 25 days of chilling, while the seeds of Coulter and Digger pines require 60 and 50 days respectively for the highest percentages of germination. Experiments dealing with the chilling of one-leaf pinon pine, another of the edible pine seeds, indicate that 30 days on ice are followed by the best germination.

Plant Physiology

Science News-Letter, July 12, 1930

Traveling Geologists

PRINCETON University's traveling summer school of geology has arrived at Grand Canyon National Park, Arizona, in its special car *Princeton* and is studying the geology of the Grand Canyon.

In its special pullman that serves as sleeper, diner, parlor car and classroom, a party of 25 students, traveling instructors and foreign geologists are crossing the country visiting mines, geological formations, oil fields and other places of mineralogical and economic interest.

Under the direction of Prof. Richard M. Field and Prof. Paul Mac-Clintock, classes are held en route and supplemented by field hikes at various points along the route. Four foreign geologists are participating in this year's trip of the International Summer School of Geology and Natural Resources: Prof. Frank Debenham of Trinity College, Cambridge, England; Dr. H. Schneiderhöhn of Friburg, Germany; Dr. P. Ramdohr of Aachen, Germany, and Dr. Otakar Matousek, of Prague, Czechoslovakia.

Geology

Science News-Letter, July 12, 1930

Locusts in Yucatan

THE first swarms of locusts, such as were reported in Guatemala in the last year, have advanced to the Mexican state of Yucatan, in the region of Mérida, and the Mexican Office of Agricultural Defense is preparing for battle.

Some scientists believe that it was plagues of locusts in the past that perhaps spelled the ruin of the Maya Empire, which mysteriously fell for no obvious good reason. The margin of agricultural security may never have been very great, and a severe plague of locusts alone, or in fortuitous combination with other causes, may have caused the downfall of an empire.

A little-known passage from Bernal Diaz, soldier of Cortes, indicates that there was a plague of locusts at the time of one of the early efforts of the Spaniards to conquer the land of the Mayas in 1518. He describes a battle with the Indians at Champoton in the Yucatecan peninsula:

"I remember that this fight took place in some fields where there were many locusts, and while we were fighting they jumped up and came flying in our faces, and as the Indian archers were pouring a hailstorm of arrows on us we sometimes mistook the arrows for locusts and did not shield ourselves from them and so got wounded; at other times we thought that they were arrows coming toward us, when they were only flying locusts, and it greatly hampered our fighting."

Entomology

Science News-Letter, July 12, 1930

For Better Gins

BECAUSE it is charged that the quality of cotton fiber today is being sacrificed to the god of efficiency who sits upon the top of the mechanical cotton gin, the Bureau of Agricultural Economics is shortly to begin researches in the south looking to the improvement of the machinery now being used.

An item of \$100,000 in the second deficiency bill which Congress passed before adjourning is specifically for cotton ginning investigations.

Representative W. M. Whittington of Mississippi, himself the owner of a ginning plant, told the House Committee on Appropriations that cloth manufacturers have complained that the cotton fiber today is not as good as that which used to be produced with the old-fashioned horse gin.

Both grade and staple are being damaged, he said, amounting to three to fifteen dollars per bale to the cotton grower. Long staple cotton is being damaged more than the short-staple, he contended.

Agricultural Engineering

Science News-Letter, July 12, 1930

Plague of Rats

A PLAGUE of field rats is invading nearly 200,000 acres of rich farm land around the Lake Chapala region in the state of Michoacan, Mexico.

The crop-eating pests appeared a year ago, and now they are a serious menace, cutting down the wheat fields and eating everything green, destroying all crops, but curiously leaving watermelons alone.

Dr. Alfonso Dampf, chief of investigations in the Office of Agricultural Defense of the Mexican Ministry of Agriculture, has just returned from the infested regions and is devising ways and means of fighting the invaders. He reports that an unusually large number of owls, natural enemies of the rats, have also appeared on the scene to help the farmers.

The rat plague has appeared in Mexico before and apparently has a cycle which, however, has not been determined. Like other biological and agricultural phenomena, he believes, it may be in some way linked with sunspot cycles, whose effects have a certain lag.

Some of the rats have been brought to Mexico City for study, and investigations are being made on them with Loeffler's enteritis organism. Rats may be infected with the disease and returned to their homes, so that they can spread the bad news to their companions.

Zoology

Science News-Letter, July 12, 1930

Boy Explorers

A SCIENTIFIC expedition consisting of a staff of 17 boy explorers, led by Hillis L. Howie and two experienced assistants, set out for the Southwest, July 2, to gather information and material for exhibition at the Children's Museum of Indianapolis.

The junior field party includes boys bearing the title of staff botanist, ornithologist, geologist, herpetologist, archaeologist, geographer, mammalogist, it is announced by Mrs. B. M. Golden, executive secretary of the museum. The boys, guided by the director, will take motion pictures and still photographs of wild life and historic scenes. They will use these pictures and their notes and measurements when they return to the museum, to build miniature settings of wild life and exhibits showing ancient Indian ruins.

Archaeology

Science News-Letter, July 12, 1930

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Sodium, Light Metal, Made Cheaply

Metallurgy

IF YOU had to fill a cubic foot of space with some metal, which metal would cost least? Iron, maybe; but, if as much as a car load were bought, the now rare and very active sodium would be a few cents cheaper, a little less than \$11.50 per cubic foot.

Revelation of the fact that sodium, the metal of extreme purity, remarkable chemical activity, and low electrical resistance, costs so little by volume is made in a comparison of prices of metals in a recent issue of *Metals and Alloys*.

Nickel is the most expensive common metal by the cubic foot, that volume costing \$192.50. The same measure of tin sells commercially for \$143.75; copper \$72.50; aluminum, \$39.50; lead, \$39; antimony, \$31.50; zinc, \$22; and ingot iron and sodium, \$11.50.

Although sodium is now as cheap as iron, if more uses for it were found it might be produced in quantity for a third the present cost. Its occurrence in close chemical combinations with other elements is common. Electrical decomposition is necessary to separate it.

Unlike most metals, sodium is so active chemically that to be kept pure it is immersed in kerosene. In air a film of oxide immediately forms on its surface. It is slightly lighter than water and melts a trifle below the boiling point of water.

In spite of the fact that sodium cannot be strung from pole to pole

and, even if it could, it would be quickly eaten away by the oxygen of the air, it might actually be used as a much cheaper and more efficient conductor of electricity than copper, *Metals and Alloys* speculates. A sodium conductor need be only a third the weight of a copper conductor to carry the same electricity, though it would be three times as large. At prices for sodium which would prevail if such conductors came into use, it would cost only a fraction as much as the equivalent copper.

"If we filled a thin copper or austenitic stainless steel tube, strong enough to carry the load with sodium," the article continues, "and could make provision to avoid difficulties from the high coefficient of expansion of sodium, from the likelihood that it would creep down into the sag of the cable if we left space inside the tube of expansion, and from the danger that would ensue if such a conductor did break, and could work out the problem of making joints and connections, we should have a cheaper conductor than either solid copper or aluminum. Crazier things have been done."

Sodium is now used chiefly as a modifier in aluminum-silicon alloys and as a hardener for lead. The chemist makes it 99.9 per cent. pure; certainly the metallurgist can find more uses for such a metal, the article challenges.

Science News-Letter, July 12, 1930

Arctic Climate Was Never Tropical

Paleoclimatology

THE old idea that Greenland and other arctic countries were once palm-filled tropical paradises is all a myth. These regions could not have been tropical, if for no other reason than that they have practically continuous night for several months each year. Even if it had stayed warm enough, the plants standing there in the dark would have starved for lack of sunlight.

This is one of the points raised in a discussion of ancient climates in the Arctic by Prof. Edward W. Berry of the Johns Hopkins University.

Prof. Berry has found, upon examining all known kinds of fossil plants from the far North, that the great majority of them belong to temperate rather than tropical

genera. In the more recent geological periods they included such trees and shrubs as alder, sweet-gum, beech, oak, elm, maple, hickory, tulip-tree and sassafras, all of which are decidedly temperate-zone plants.

Some more or less tropical trees have been found, such as fig and cinnamon; but Prof. Berry points out that cultivated figs generally ripen their fruits as far north as Baltimore, and that many of the trees that grow in tropic latitudes have their homes high up on the mountainsides, and are therefore really temperate-climate plants after all.

The plants of older periods, such as the coal age, have all disappeared from the earth, so that we cannot judge their climatic requirements.

Science News-Letter, July 12, 1930

Needless Operations

MANY operations could be avoided by careful study of the mental and nervous factors, Dr. George A. Moleen of Denver said at the recent American Medical Association meeting. He told of cases in which persons suffered from what appeared to be conditions requiring surgical operations. Yet these people recovered when their mental distress was relieved, without any operation.

Severe mental and emotional shock may cause various disturbances of stomach and intestinal tract and may even play a part in the development of stomach ulcers, Dr. Moleen said. Shock of other kinds is known to affect the stomach. For instance, the shock of a broken bone in arm or leg often causes nausea or vomiting. In susceptible persons who have easily upset mental and nervous systems, the secretions of the stomach, liver and pancreas are distinctly influenced by shock to the mind and emotions. This condition has not received the attention it deserves, Dr. Moleen said.

Medicine

Science News-Letter, July 12, 1930

Curing Epilepsy

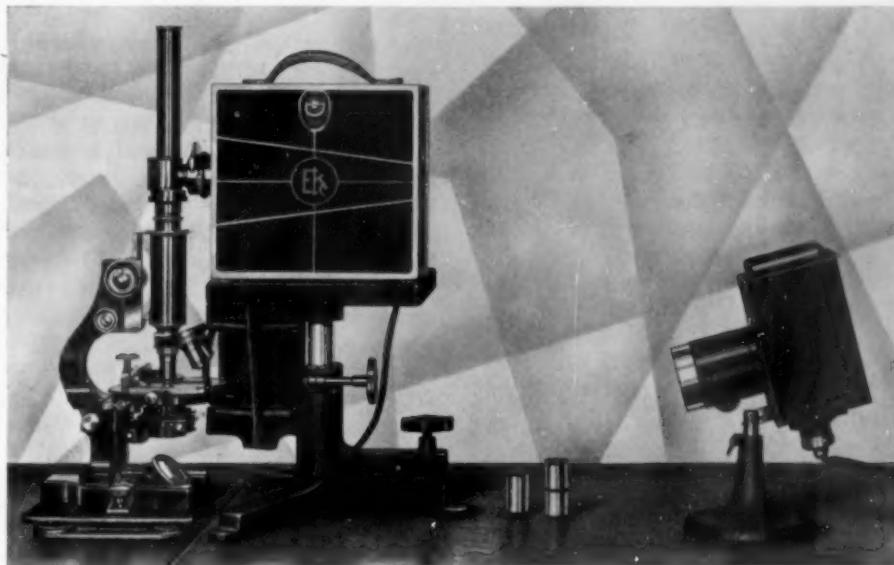
MANY encouraging cures of epilepsy were reported by Dr. Henry F. Helmholtz and Dr. Haddow M. Keith of Rochester, Minn. The physicians used a diet high in fat content, known as the ketogenic diet. It was worked out by Dr. Russel M. Wilder, formerly of the Mayo Clinic and now at the University of Chicago. The diet gets its name from substances called ketones which are produced in excessive amounts in the blood of persons following it.

Epilepsy is one of the most difficult maladies doctors have to combat. Because little is known definitely about it, anything which has been tried in the way of treatment and cure has been little more than a stab in the dark. The Rochester physicians have been working with this special diet for eight years. During that time they have followed 141 patients who kept faithfully to the diet. Of these 43 are cured, Dr. Helmholtz said.

They have not suffered epileptic attacks for periods varying from one to seven years. Thirty-two more patients were definitely improved while 66 definitely did not improve. Some of those who were improved were able to return to a normal diet while others suffered recurrences of the disease when they abandoned the diet.

Medicine

Science News-Letter, July 12, 1930



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Physics

A BRIEF ACCOUNT OF MICROSCOPICAL OBSERVATIONS ON THE PARTICLES CONTAINED IN THE POLLEN OF PLANTS; and on the general Existence of Active Molecules in Organic and Inorganic Bodies. By Robert Brown. In the Edinburgh Journal of Science, Vol. IX. April-October, M.DCCC.XXVIII. (1828).

THE following observations have all been made with a simple microscope, and indeed with one and the same lens; the focal length of which is about 1/32d of an inch.

The examination of the unimpregnated vegetable Ovulum, an account of which was published early in 1826, led me to attend more minutely than I had before done to the structure of the Pollen, and to inquire into its mode of action on the Pistillum in Phænogamous plants. . . .

My inquiry on this point was commenced in June 1827, and the first plant examined proved in some respects remarkably well adapted to the object in view.

This plant was *Clarkia pulchella*, of which the grains of pollen, taken from antheræ full grown, but before bursting, were filled with particles or granules of unusually large size, varying from nearly 1/4000th to about 1/3000th of an inch in length, and of a figure between cylindrical and oblong, perhaps slightly flattened, and having rounded and equal extremities. While examining the form of these particles immersed in water, I observed many of them very evidently in motion; their motion consisting not only of a change in the fluid, manifested by alterations in their relative positions, but also not unfrequently of a change of form in the particle itself; a contraction or curvature taking place repeatedly about the middle of one side, accompanied by a corresponding swelling or convexity on the opposite side of the particle. In a few instances the particle was seen to turn on its longer axis. These motions were such as to satisfy me, after frequently repeated observation, that they arose neither from currents in the fluid, nor from its gradual evaporation, but belonged to the particle itself.

Grains of pollen of the same plant taken from antheræ immediately after bursting, contained similar subcylindrical particles, in reduced numbers, however, and mixed with other particles, at least as numerous, of much smaller size, apparently spherical, and in rapid oscillatory motion. . . .

Having found motion in the particles of the pollen of all the living plants which I had examined, I was led next to inquire whether this property continued after the death of the plant, and for what length of time it was retained.

In plants, either dried or immersed in spirit for a few days only, the particles of pollen of both kinds were found in motion equally evident with that observed in the living plant; specimens of several plants, some of which had been dried and preserved in an herbarium for upwards of twenty years, and others not less than a century, still exhibited the molecules or smaller spherical particles in considerable numbers, and in evident motion, along with a few of the larger particles, whose motions were much less manifest, and in some cases not observable.

In this stage of the investigation having found, as I believed, a peculiar character in the motions of the particles of pollen in water, it occurred to me to appeal to this peculiarity as a test in certain families of cryptogamous plants, namely Mosses, and the genus *Equisetum*, in which the existence of sexual organs had not been universally admitted.

In the supposed stamina of both these families, namely, in the cylindrical antheræ or pollen of Mosses, and on the surface of the four spathulate bodies surrounding the naked ovulum, as it may be considered, of *Equisetum*, I found minute spherical particles, apparently of the same size with the molecule described in *Onagrariae*, and having equally vivid motion on immersion in water; and this motion was still observable in specimens both of Mosses and of *Equiseta*, which had been dried upwards of one hundred years.

The very unexpected fact of seeming vitality retained by these minute particles so long after the death of the plant, would not perhaps have

materially lessened my confidence in the supposed peculiarity. But I at the same time observed, that on bruising the ovula or seeds of *Equisetum*, which at first happened accidentally, I so greatly increased the number of moving particles, that the source of the added quantity could not be doubted. I found also that on bruising first the floral leaves of Mosses, and then all other parts of those plants, that I readily obtained similar particles, not in equal quantity indeed, but equally in motion. My supposed test of the male organ was therefore necessarily abandoned.

Are these Particles Molecules?

Reflecting on all the facts with which I had now become acquainted, I was disposed to believe that the minute spherical particles or molecules of apparently uniform size, first seen in the advanced state of the pollen of *Onagrariae*, and most other phænogamous plants,—then in the antheræ of Mosses, and on the surface of the bodies regarded as the stamina of *Equisetum*,—and lastly, in bruised portions of other parts of the same plants, were in reality the supposed constituent or elementary molecules of organic bodies, first so considered by Buffon and Needham, then by Wrisberg with greater precision, soon after and still more particularly by Müller, and very recently by Dr. Milne Edwards, who has revived the doctrine, and supported it with much interesting detail. I now, therefore, expected to find these molecules in all organic bodies: and, accordingly, on examining the various animal and vegetable tissues, whether living or dead, they were always found to exist; and merely by bruising these substances in water, I never failed to disengage the molecules in sufficient numbers to ascertain their apparent identity in size, form, and motion, with the smaller particles of the grains of pollen.

I examined also various products of organic bodies, particularly the gum resins, and substances of vegetable origin, extending my inquiry even to pit-coal; and in all these bodies molecules were found in abundance. I remark here also, partly as a caution to those who may hereafter

engage in the same inquiry, that the dust or soot deposited on all bodies in such quantity, especially in London, is entirely composed of these molecules.

One of the substances examined was a specimen of fossil wood, found in Wiltshire oolite, in a state to burn with flame; and as I found these molecules abundantly, and in motion in this specimen, I supposed that their existence, though in smaller quantity, might be ascertained in mineralized vegetable remains. With this view a minute portion of silicified wood, which exhibited the structure of coniferae, was bruised, and spherical particles, or molecules in all respects like those so frequently mentioned, were readily obtained from it; in such quantity, however, that the whole substance of the petrifaction seemed to be formed of them. But hence I inferred that these molecules were not limited to organic bodies, nor even to their products.

In Mineral Bodies

To establish the correctness of the inference, and to ascertain to what extent the molecules existed in mineral bodies, became the next object of inquiry. The first substance examined was a minute fragment of window-glass, from which when merely bruised on the stage of the microscope, I readily and copiously obtained molecules agreeing in size, form, and motions with those which I had already seen.

I then proceeded to examine, and with similar results, such minerals as I either had at hand or could readily obtain, including several of the simple earths and metals, with many of their combinations.

Rocks of all ages, including those in which organic remains have never been found, yielded the molecules in abundance. Their existence was ascertained in each of the constituent minerals of granite, a fragment of the sphinx being one of the specimens examined.

To mention all the mineral substances in which I have found these molecules would be tedious; and I shall confine myself in this summary to an enumeration of a few of the most remarkable. These were both of aqueous and igneous origin, as travertine, stalactites, lava, obsidian, pumice, volcanic ashes, and meteorites from various localities. Of metals I may mention manganese, nickel, plumbago, bismuth, antimony, and arsenic. In a word, in every mineral which I could reduce to a powder, suffi-

ciently fine to be temporarily suspended in water, I found these molecules more or less copiously; and in some cases, more particularly in siliceous crystals, the whole body submitted to examination appeared to be composed of them.

In many of the substances examined, especially those of a fibrous structure, as asbestos, actinolite, tremolite, zeolite, and even stearite, along with the spherical molecules, other corpuscles were found, like short fibres somewhat moniliform, whose transverse diameter appeared not to exceed that of the molecule, of which they seemed to be primary combinations. These fibrils, when of such length as to be probably composed of not more than four or five molecules, and still more evidently when formed of two or three only, were generally in motion, at least as vivid as that of the simple molecule itself; and which, from the fibril often changing its position in the fluid, and from its occasional bending, might be said to be somewhat vermicular.

In other bodies which did not exhibit these fibrils, oval particles of a size about equal to two molecules, and which were also conjectured to be primary combinations of these, were not unfrequently met with, and in motion generally more vivid than that of the simple molecule, their motion consisting in turning usually on their longer axis, and then often appearing to be flattened. Such oval particles were found to be numerous and extremely active in white arsenic.

As mineral bodies which had been fused contained the moving molecules as abundantly as those of alluvial deposits, I was desirous of ascertaining whether the mobility of the particles existing in organic bodies was in any degree affected by the application of intense heat to the containing substance. With this view small portions of wood, both living and dead, linen, paper, cotton, wool, silk, hair, and muscular fibres, were exposed to the flame of a candle, or burned in platina forceps, heated by the blowpipe; and in all these bodies so heated, quenched in water, and immediately submitted to examination, the molecules were found, and in as evident motion as those obtained from the same substances as before burning.

There are three points of great importance which I was anxious to ascertain respecting these molecules, namely, their form, whether they are of uniform size, and their absolute magnitude. I am not, however, en-

tirely satisfied with what I have been able to determine on any of these points.

As to form, I have stated the molecule to be spherical, and this I have done with some confidence; the apparent exceptions which occurred admitting, as it seems to me, of being explained by supposing such particles to be compounds. This supposition in some of the cases is indeed hardly reconcileable with their apparent size, and requires for its support the further admission, that, in combination, the figure of the molecule may be altered. In the particles formerly considered as primary combinations of molecules, a certain change of form must also be allowed; and even the simple molecule itself has sometimes appeared to me when in motion to have been slightly modified in this respect.

Size and Uniformity of Particles

My manner of estimating the absolute magnitude and uniformity in size of the molecules, found in the various bodies submitted to examination, was by placing them on a micrometer divided to five thousandths of an inch, the lines of which were very distinct; or more rarely on one divided to ten thousandths, with fainter lines, not readily visible without the application of plumbago, as employed by Dr. Wollaston, but which in my subject was inadmissible.

The results so obtained can only be regarded as approximations, on which perhaps, for an obvious reason, much reliance will not be placed. From the number and degree of accordance of my observations, however, I am upon the whole disposed to believe the simple molecule to be of uniform size, though as existing in various substances and examined in circumstances more or less favorable, it is necessary to state that its diameter appeared to vary from 1/15000th to 1/20000th of an inch.

I shall not at present enter into additional details, nor shall I hazard any conjectures whatever respecting these molecules, which appear to be of such general existence in inorganic as well as in organic bodies; and it is only further necessary to mention the principal substances from which I have not been able to obtain them. These are oil, resin, wax, and sulphur, such of the metals as I could not reduce to the minute state of division necessary for their separation, and finally, bodies soluble in water.

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Medicine
Science News-Letter, July 12, 1930

Health Fellowships

THE FIRST endowment for the new National Institute of Health has just been received from the Chemical Foundation.

This institution has presented \$100,000, the income from which is to go for fellowships in basic chemical research matters which have to do with public health.

The gift was made to the Treasury through Senator Joseph E. Ransdell of Louisiana, who sponsored the legislation which has made the National Institute of Health a reality.

Medicine
Science News-Letter, July 12, 1930

New Typhus Carriers

MYSTERY surrounds the insect which transmits typhus fever in this country. The body louse, which transmits the disease in the Old World, does not seem to be the transmitting agent here, studies of the U. S. Public Health Service have indicated. These studies were begun some time before the present flare-up of cases in Virginia and Maryland. The disease has existed in endemic form in the United States for several years, and no alarm need be felt about any widespread epidemic from the present outbreak, health officers stated.

More cases seem to have been reported this year than last, but this may not mean that there actually are more cases. Public health officers have been talking a lot about the disease in recent years and consequently physicians are watching for it and probably cases are being reported which formerly would have been unrecognized.

The Public Health Service studies are directed toward finding what insect transmits the disease in this country, since the louse seems to be out. At that, the investigators have only negative proof that the disease is not transmitted by lice in this country as well as in Europe. The patients who have been examined did not have any lice on their bodies or clothing. This does not exclude the possibility of their having been bitten by an infected louse two weeks or so before getting sick, health officials explained.

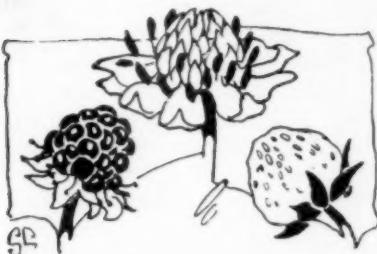
Ticks, blood-sucking mites, and fleas are some of the insects now held under suspicion and being investigated as possible transmitters of typhus fever. No definite results have been obtained thus far.

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NATURE RAMBLINGS

By Frank Thone



Kinsfruits

HERE is a lot of easily-done botany in a mixed basket of fruit or berries. One can get considerable amusement determining relationship or lack of it, by picking them to bits—not neglecting to eat the specimens after the scientific exercise has been finished, of course.

The kinship between apples, pears and quinces is quite obvious, or that between oranges, lemons, limes and grapefruit. But it may take a little more ingenuity to show that cherries, blackberries, raspberries, strawberries, and the dry "seeds" that follow such flowers as agrimony, are all cousins.

Let us start with the cherry and the raspberry. Pick the raspberry into the small pieces naturally marked off in its flesh. Cut or bite into one of these pulpy fragments, and you find a single hard little seed. The raspberry is a tight-packed cluster of tiny "cherries."

Between raspberry and blackberry the likeness is more obvious. A blackberry is solid in the center where the raspberry is hollow, that is all. The solid, edible center of the blackberry is the same thing, essentially, as the tough little stem-end that remained on the bush when the raspberry was plucked.

Now imagine the same pulpy stem-end greatly increased in size, while the "cherries" on its outside have shrunk and shriveled until nothing but their pits remain. That is the strawberry. The strawberry is all edible stem-end, as the raspberry is all outside fruits.

Finally, consider the possibility of the "cherries" being like those of the strawberry and the stem-end being like that of the raspberry. Here would be a fruit all dry and hard, not edible at all. Such is the fruit of the agrimony flower.

Science News-Letter, July 12, 1930

Scientists Begin to Study Perseveration

Psychology

WHEN little Junior finds absorbing interest in some monotonous task, such as transferring endless marbles from one box to another, and when he refuses howling to come away from such aimless pursuits to eat his dinner, young Junior is displaying "perseveration," a trait of human nature that has been very little explored by science.

Experiments with children, conducted by Dr. Hazel M. Cushing, at Columbia University, show that individual children differ conspicuously in the amount of this trait that they possess. Perseveration may be explained simply as the tendency of a child, or an adult either, to continue an activity when there is no goal in view. The adult who hums the same tune over and over is not very different from little Junior with his boxes of marbles.

Experiments with seventy children between two and five years have led Dr. Cushing to conclude that an individual has a certain amount of this trait as an inborn characteristic, and he continues to display that degree of perseveration throughout

life. Boys are slightly more inclined to it than girls, judging by the seventy youngsters tested.

Dr. Cushing points out that possibly "much of the behavior at present ascribed to stupidity, disobedience, defiance, stubbornness, lack of cooperativeness, might be better explained on the grounds of the presence to a high degree of a perseverating tendency."

Further exploration of this trait, which has been recognized by psychologists for some years but has never been intensively studied, is advocated by Dr. Cushing, who believes that it may be important in understanding adults as well as children, and that it may be important in vocational pursuits.

Science News-Letter, July 12, 1930

To teach children to select balanced lunches in a cafeteria, three public schools are giving the children tickets as they pass with their luncheon trays, healthful lunches being graded "A," while others get tickets marked to indicate deficiencies.

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FIRST GLANCES AT NEW BOOKS

GUIDE LEAFLET FOR AMATEUR ARCHAEOLOGISTS—*National Research Council*, 11 p., 25c each (50 or more copies, 4c each). It is no small task to figure out practical ways of reaching the ears of amateur archaeologists in order to show them how they should proceed when they discover some Indian ruin or relic, so that they may dig and collect constructively instead of destructively. This little pamphlet is quite an achievement in this direction of giving the amateur a great deal of specific information, simply worded, and brief. The reader is not only shown clearly why he should refrain from digging up hastily an arrow head or jar without recording the data that will make the object a part of the prehistoric story of America. He is also shown very definitely how to make a survey and record the facts and preserve the material. The pamphlet is not a complete course in American archaeology, but it is a most informative introduction.

Archaeology

Science News-Letter, July 12, 1930

PRELIMINARY NOTICE OF THE DISCOVERY OF AN ADULT SINANTHROPOUS SKULL AT CHOU KOU TIEN—Davidson Black; PRELIMINARY REPORT ON THE CHOU KOU TIEN FOSSILIFEROUS DEPOSIT—P. Teilhard de Chardin and C. C. Young; AN ACCOUNT OF THE DISCOVERY OF AN ADULT SINANTHROPOUS SKULL IN THE CHOU KOU TIEN DEPOSIT—W. C. Pei. These three reprints from the Bulletin of the Geological Society of China constitute the first full scientific account of the newly discovered Peking Man.

Anthropology—Paleontology

Science News-Letter, July 12, 1930

REAR ADMIRAL BYRD AND THE POLAR EXPEDITIONS—Coram Foster—*Burt*, 256 p., 75c. As a popular, low-priced biography of a great hero of exploration, this book will undoubtedly serve its purpose. The book was evidently written without recourse to the official account of the Antarctic expedition and it is singular that, although the part played by the National Geographic Society is prominently mentioned, there is practically no credit given to the *New York Times* and associated newspapers for their extraordinary reporting of Admiral Byrd's explorations by radio.

Biography—Exploration

Science News-Letter, July 12, 1930

THE NEGRO IN AMERICAN CIVILIZATION—Charles S. Johnson—*Henry Holt*, 538 p., \$4. This is an important study of the negro in America, dealing with the following phases of negro life: industry and agriculture, health, housing, education, recreation, law observance, citizenship, and race relations. The first part of the book is written by Dr. Johnson, one of the foremost negro sociologists, while the second part is a symposium by other leading authorities. The study that resulted in this book was planned to provide a contemporary picture of negro life in relationship to the white race, and it was initiated by 16 national organizations engaged in social work of the negro and the improvement of relationships between the two predominant races of this country.

Sociology

Science News-Letter, July 12, 1930

INORGANIC QUALITATIVE CHEMICAL ANALYSIS—Allan R. Day—*Chemical Publishing Co.*, 197 p., \$2.75. This college textbook attempts "to realize a closer relationship between facts and theories so that the student may be better equipped to interpret analytical reactions." The author is assistant professor of chemistry at the University of Pennsylvania.

Chemistry

Science News-Letter, July 12, 1930

AERONAUTICS BRANCH DEPARTMENT OF COMMERCE—Laurence F. Schmeckebier—*Brookings Institution*, 144 p., \$1.50. This latest service monograph of the United States Government, prepared by the Institute for Government Research, describes the history, activities, and organization of that branch of the government which is charged with the promotion and regulation of aeronautics.

Aeronautics

Science News-Letter, July 12, 1930

OEUVRES D'EMILE GODLEWSKI PERE—Edited by Ladislas Vorbrodt—*Univ. of Cracow*, 598 p. This volume is the first of the collected works of one of Poland's most noted scientists, covering his contributions in plant physiology during the period 1870-1890. The papers cover a wide range of subjects, and are printed in Polish, German and French. The publication is undertaken by the Polish Academy of Sciences, on a fund provided by L. J. Fedorowicz.

Plant Physiology

Science News-Letter, July 12, 1930

CONSERVATION OF OUR NATURAL RESOURCES—Edited by Loomis Havemeyer—*Macmillan*, 551 p., \$4. The great conservation movement which dates historically from the famous White House Conference of 1908 called by President Roosevelt has accomplished much in the intervening years, but there are problems now which could not be foreseen more than 20 years ago when the people were awakened to the fact that natural resources are not inexhaustible. A group of experts have therefore cooperated in the rewriting of the first popular presentation of The Conservation of Natural Resources, a book by President Van Hise of Wisconsin published in 1910. In its 1930 edition this book is an admirable discussion of the present conservation problem.

General Science

Science News-Letter, July 12, 1930

ROSIN IN SYNTHETIC RESINS—W. B. Burnett—*Pine Institute of America*, 96 p. This publication, in bound mimeograph, constitutes the first number of a Technical Bulletin series undertaken by the Pine Institute of America. It consists of abstracts of all pertinent papers on the use of rosin in synthetic resins. It will be of interest to teachers of industrial chemistry as well as to chemists in industrial plants.

Chemistry

Science News-Letter, July 12, 1930

THE FUNDAMENTALS OF PUBLIC SCHOOL ADMINISTRATION—Ward G. Reeder—*Macmillan*, 579 p., \$2.25. Keeping the machinery of a school system running is now a complex business enterprise, even in small-sized communities. The task for the superintendent, the board of education, and the hierarchy of school officials includes many problems unknown to the little red school house—training new teachers, for example, measuring their efficiency after they are appointed, planning the janitor's work, building and financing school buildings, and deciding how they may suitably be used out of school hours, purchasing and rationing supplies, even knowing how to get desirable publicity for the school system. These and a good many other topics are included in the author's discussion of "the more urgent problems."

Education

Science News-Letter, July 12, 1930